for an electric vehicle having features previously described for electric vehicles **100** and **500**, including a primary battery **652**, e.g., such as primary battery **552**, and utilizing an auxiliary battery module **602** such as auxiliary battery modules **102**, **202** and **502** as previously described herein, wherein both the auxiliary battery module **602** and primary battery **652** provide power to the vehicle powertrain for propelling the electric vehicle. Components other than the auxiliary battery module **602** illustrated in FIG. **6**A are components of the electric vehicle in the example of FIG. **6**A.

[0045] As shown in FIG. **6**A, the electric vehicle comprises a powertrain system **610** (including one or more electric motors such as previously described), a powertrain coolant line **612** that passes through a radiator **614**, and that is connected to a degas/bleed coolant reservoir **616**, and that is further connected to a pump **618** for circulating coolant. The electric vehicle also includes an active grill shutter AGS **620** positioned adjacent to the radiator **614** and controlled by a motor or other suitable actuator. The vehicle **100** also includes a refrigeration system including a condenser **622**, a receiver dryer (RD) **623** (e.g., comprising a desiccant to remove moisture), refrigerant lines **624**, a fan **626**, an electric A/C compressor (EAC) **628**, and expansion valve **630**, which may be a thermal expansion valve with a solenoid or an electronic expansion valve. Refrigerant lines **624** are shown, in this example, using a dotted line to illustrate what may typically be a low pressure refrigerant (e.g., which may correspond to a gaseous state) and using a dashed line to illustrate what may typically be a high pressure refrigerant (e.g., which may correspond to a liquid state). Pressure sensors **627** and temperature sensors **629** may be located at one or both refrigerant lines **624** at both sides of the EAC **628** to monitor/measure the pressure and temperature, respectively, of the refrigerant, e.g., for use in controlling the EAC **628**. The refrigerant system is also connected to a cabin HVAC module **632** via an expansion valve **631** and refrigerant lines **624** for providing cabin air conditioning.

[0046] In the example of FIG. **6**A, the electric vehicle also includes a primary battery coolant line **634** (e.g., metal tubing such as copper alloy, aluminum alloy, steel alloy, etc.) that is connected to a coolant pump **636**, a coolant heater **638**, a degas/bleed coolant reservoir **640**, a heat exchanger **642** (e.g., a refrigerant-to-coolant heat exchanger), and the primary battery **652**. These components as connected by the primary battery coolant line **634** and together with the primary battery coolant line **634** form a primary battery cooling loop.

[0047] In addition, in the example of FIG. **6**A, the electric vehicle includes an auxiliary battery coolant line **654** (e.g., metal tubing such as copper alloy, aluminum alloy, steel alloy, etc.) that is connected to another degas/bleed coolant reservoir **656**, another coolant pump **658**, the auxiliary battery module **602** (with an internal first conduit portion **660**), and the heat exchanger **642**. The portion of the auxiliary battery coolant line **654** that resides outside the auxiliary battery module **602** may be referred to as a second conduit portion **662**. Such as previously described herein, the auxiliary battery module includes a first fluid connector including an inlet fluid connector **664** and an outlet fluid connector **666**, respectively (e.g., suitable dry-break fluid connectors, such as flat-face fluid connectors described previously herein). In addition, the electric vehicle includes a second fluid connector including an inlet fluid connector **670** and an outlet fluid connector **668**, respectively (e.g., dry-break fluid connectors, such as flat-face fluid connectors such as previously described herein).

[0048] A controller **680** (that includes an onboard computer) at the electric vehicle, such as previously described herein, monitors a first temperature sensor **682** at the primary battery **652** and a second temperature sensor **684** at the auxiliary battery module **602**, and detects whether either of those temperature sensors measure an out-of-range temperature condition (e.g., a measured temperature exceeds one or more upper threshold values or falls below one or more lower threshold values), and, if so, and can control and adjust (via electrical signals over electrical connection lines, not shown in FIG. **6**A) any or all of the EAC compressor **628**, pumps **636** and **658**, fan **626**, active grill shutter **620**, expansion value **630**, and coolant heater **638** to bring and maintain the temperature of the respective battery **602** or **652** to values within one or more permissible ranges.

[0049] In the example of FIG. **6**A, it will be observed that the primary battery cooling loop and the auxiliary battery module cooling loop are separate closed coolant loops and may therefore be considered parallel closed coolant loops. In addition, it will be observed that both the primary battery cooling loop and the auxiliary battery module cooling loop share the same heat exchanger **642** (e.g., refrigerant-to-coolant heat exchanger), and in this sense, the heat exchanger **642** may be considered a dual heat exchanger.

[0050] With regard to disconnection and reconnection of the auxiliary battery module **602**, it will be observed that no isolation valves are necessary to close off the auxiliary battery module cooling loop, because disconnection of the first fluid connector (including **664** and **666**) and second fluid connector (including **668** and **670**) isolates the coolant in the loop.

[0051] FIG. **6**B illustrates another exemplary functional block diagram of a thermal management system for an electric vehicle having features previously described for electric vehicles **100** and **500** and including a primary battery **652**, e.g., such as primary battery **552**, and utilizing an auxiliary battery module **602** such as auxiliary battery modules **102**, **202** and **502** as previously described herein, wherein both the auxiliary battery module **602** and primary battery **652** provide power to the vehicle powertrain for propelling the electric vehicle. The example of FIG. **6**B differs from the example of FIG. **6**A only in that the pump **658** and degas/bleed coolant reservoir **656** are located at the auxiliary battery module **602** instead of being located at the electric vehicle. Accordingly, the previous discussion of the common components and operation is not reproduced here.

[0052] FIG. **6**C illustrates another functional block diagram of an exemplary thermal management system for an electric vehicle having features previously described for electric vehicles **100** and **500** and including a primary battery **652**, e.g., such as primary battery **552**, and utilizing an auxiliary battery module **602** such as auxiliary battery modules **102**, **202** and **502** as previously described herein, wherein both the auxiliary battery module **602** and primary battery **652** provide power to the vehicle powertrain for propelling the electric vehicle. Unlike the example of FIG. **6**A, in which the primary battery **652** and the auxiliary battery module **602** are cooled via separate, parallel closed coolant loops (albeit sharing the same heat exchanger **642**), in the example of FIG. **6**C, the auxiliary battery module **602**